PHENIX library dependencies

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issue 2

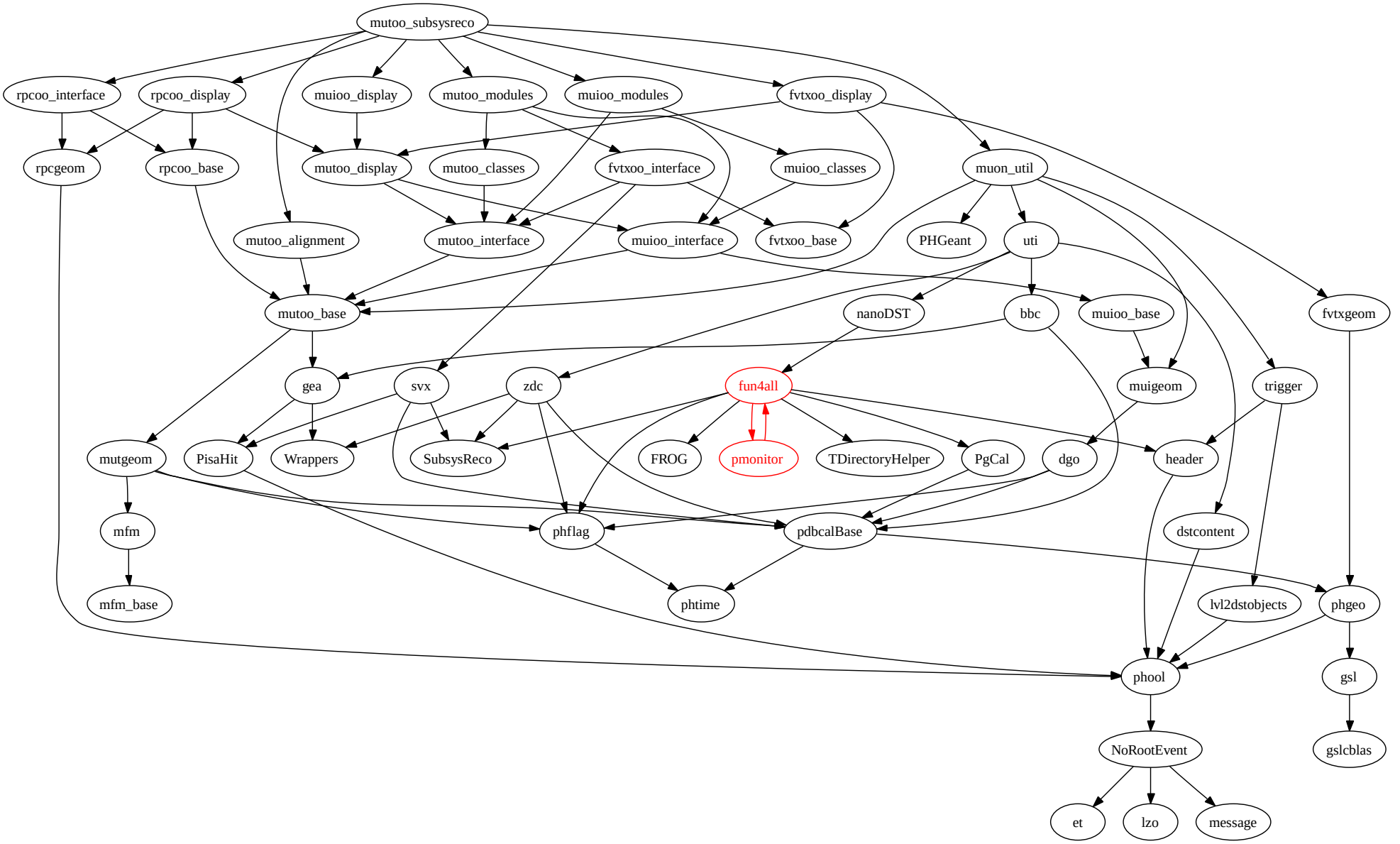
Running phenix jobs (either central or muon arm reconstruction) takes a lot of memory usage.

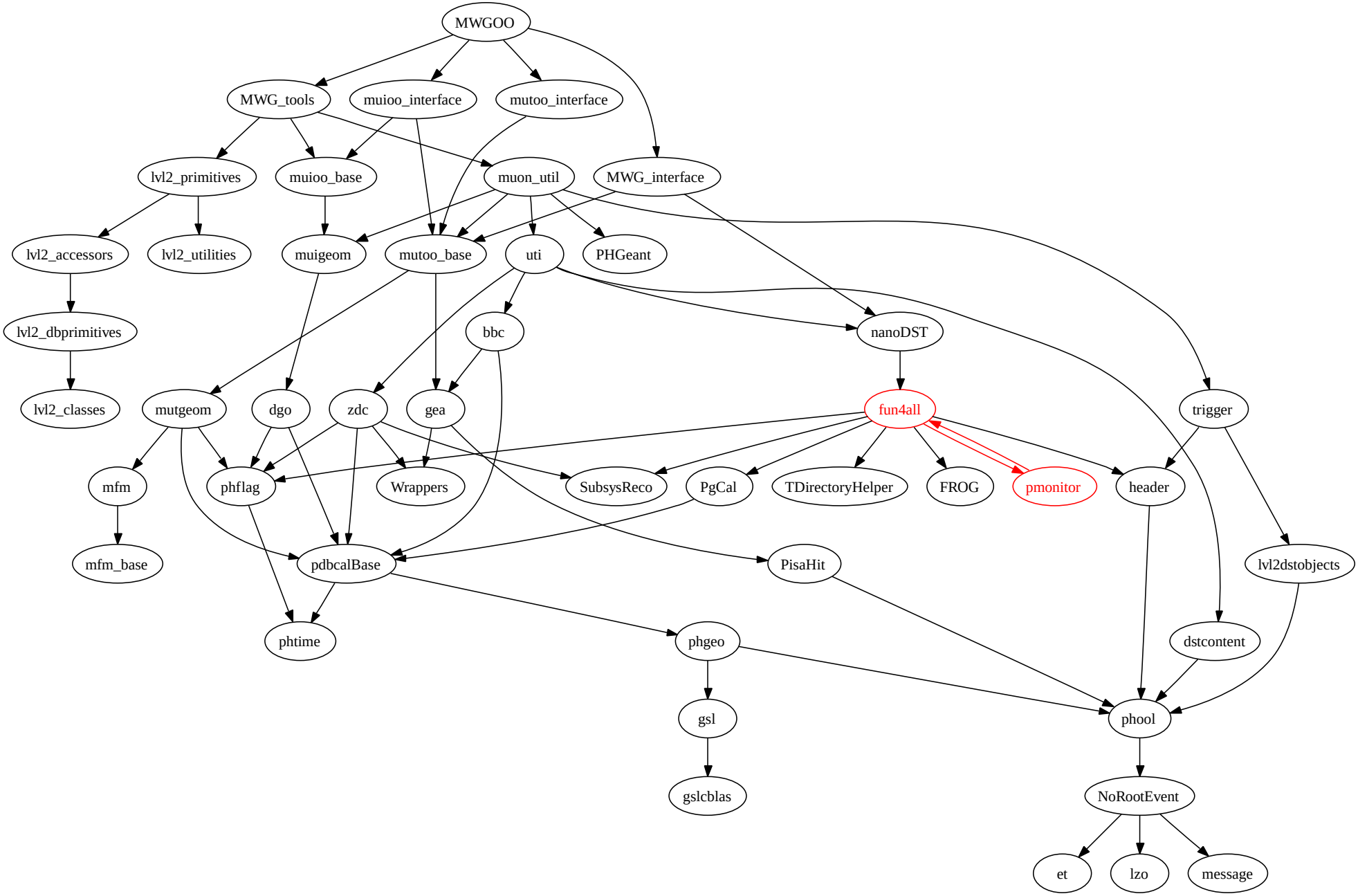
Apart from modifying the code, one idea would be to better decoupled the muon and central arm libraries, so that a muon reconstruction job loads only the minimum required of the central arm libraries; and vice-versa.

Following are some sketches of the library dependencies I figured using a script based on *nm* based on which symbols are undefined in a given library, and which library defines it.

They show the dependencies for

- **mutoo_subsysreco**, the core of the muon reconstruction;
- **MWGOO** the muon arm MWG reconstruction library (needed on top of the above to get small output
- **fun4allfuncs** the core of the central arm reconstruction


mutoo_subsysreco
rpcoo_interface
rpcoo_display
muioo_display
mutoo_modules
muioo_modules
fvtxoo_display
rpcgeom
rpcoo_base
mutoo_display
mutoo_classes
fvtxoo_interface
muioo_classes
muon_util
mutoo_alignment
mutoo_interface
muioo_interface
fvtxoo_base
PHGeant
uti
mutoo_base
nanoDST
bbc
muioo_base
fvtxgeom
gea
svx
zdc
fun4all
muigeom
trigger
mutgeom
PisaHit
Wrappers
SubsysReco
FROG
pmonitor
TDirectoryHelper
PgCal
dgo
header
mfm
phflag
pdbcalBase
dstcontent
mfm_base
phtime
lvl2dstobjects
phgeo
phool
gsl
NoRootEvent
gslcblas
et
lzo
message


MWGOO
MWG_tools
muioo_interface
mutoo_interface
lvl2_primitives
muioo_base
muon_util
MWG_interface
lvl2_accessors
lvl2_utilities
muigeom
mutoo_base
uti
PHGeant
lvl2_dbprimitives
bbc
nanoDST
lvl2_classes
mutgeom
dgo
zdc
gea
fun4all
trigger
mfm
phflag
Wrappers
SubsysReco
PgCal
TDirectoryHelper
FROG
pmonitor
header
mfm_base
pdbcalBase
PisaHit
lvl2dstobjects
phtime
phgeo
dstcontent
gsl
phool
gslcblas
NoRootEvent
et
lzo
message

fun4allfuncs
spin
emc
mutoo_interface
tecpid
CNT
CrkPID
RawDataCheck
crk
t0
emc-simulation
cgl
emc-realdata
emc-simulation2
dch
tof
acc
muioo_interface
pad
reactionplane
emc-calibration
emc-reconstruction
emc-datatypes
muioo_base
rxnp_interface
uti
mpc
ert
emcEmbedAfterBurners
emcCalib2
mutoo_base
bbc
hbd
muigeom
tec
tofw
rxnp_base
nanoDST
emc-common
emcCalib
mutgeom
gea
dgo
zdc
svx
fcl
dstcontent
fun4all
trigger
Wrappers
EmcDynamic
mfm
PisaHit
SubsysReco
phflag
TDirectoryHelper
PgCal
FROG
pmonitor
header
EmcStatic
mfm_base
pdbcalBase
vtx
emcDataManager
phgeo
lvl2dstobjects
gsl
phtime
phool
gslcblas
NoRootEvent
et
lzo
message

Conclusion (1) 6

For the muon reconstruction :

One should get rid of loading the following set of libraries: RPC, FVTX, and SVX. (I think these are due to the event display, and possibly some evaluators).

The other libraries (BBC, ZDC notably) are all needed, I think.

For fun4allfuns :

One should remove the dependency of fun4all funcs over mutoo/muioo interface. They come from GlobalReco. One should split GlobalReco in two modules and update the macros accordingly.

The dependency of cgl over svx is unfortunate.

The dependency of RxNP over mutoo_base is mandatory (for PHMap).

One should remove the dependency of mutoo_base over mutgeom (and thus mfm). Maybe create a mutoo_core, that only contains PHMap, PHKey, needed for all *smart container* subsystems (fvtx, rxnp, rpc, mutoo, and muioo).

The rest looks ok.

Conclusion (2)

This is not the end of the story: a muon arm reconstruction macro requires to run the reconstruction for say the BBC (BBCReco), the ZDC, the RxNP (for instance). Right now, this requires loading *fun4allfuncs* which means: loading the entire PHENIX software.

One should aim to splitting fun4allfuncs in three parts:

- fun4allfuncs_common (including BBC, ZDC, RxNP)
- fun4allfuncs_central
- fun4allfuncs_muons (would be close to empty).

Possibly add: fun4allfuncs_upgrades

TODO

- items on previous slide
- make sure the Makefiles do not contain more than the links shown in the previous slides
- split the libraries that need to (mostly fun4allfuncs)
- take care of the central arm *WG* libraries.
- take care of the downstream libraries, namely Cabanaboy.